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A STUDY OF THE WHITE MARKED TUSSOCK MOTH

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Early in the winter of 1921-22 it was observed that egg masses of the white marked tussock moth, *Hemerocampa leucostigma* Smith and Abbot were unusually abundant. Taking advantage of this opportunity it was planned to make a careful study of the life history of that interesting insect. This insect is of considerable economic importance in that the larvæ when abundant defoliate trees of various species.

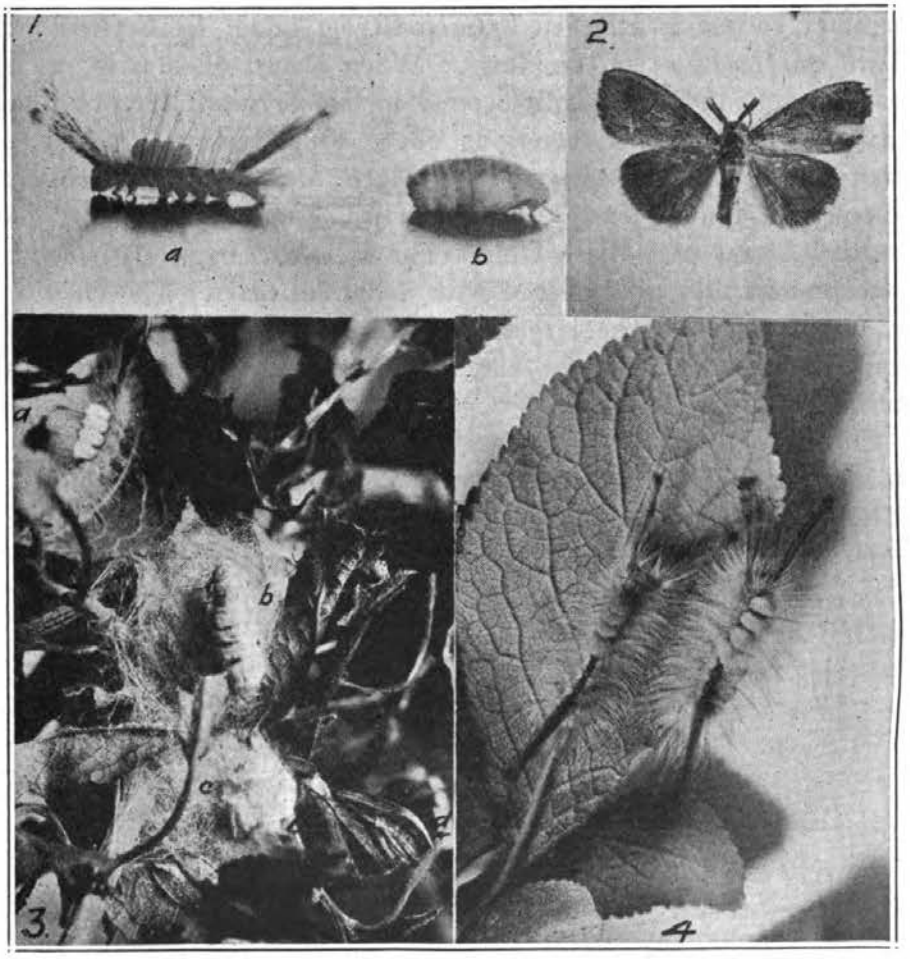

Fig. 1. The White marked Tussock Moth (*Hemerocampa leucostigma* Smith and Abbot) 1. a. Mature larva; b. adult female; 2. adult male; 3. a. Larva; b. adult female on cocoon; c. egg mass on cocoon; d. adult male. 4. Mature larvæ.

The larva is a beautiful slender hairy caterpillar about one and one-fourth inches long when fully grown. The dominating color is bright canary yellow. Four dense cream colored tufts of erect hairs on the first four abdominal segments are characteristic and give a basis for the name. A dorsal and a lateral stripe of blackish, two long black hair pencils projecting from the coral head and another from the posterior end and two brilliant red protuberances on the sixth and seventh abdominal segments lend to the decorations. The larva when dropping from one object to another spins a fine web which it can reclimb. The adult male is an ashy gray moth expanding about one and one-fourth inches. The female is light gray and is wingless, which fact offers opportunity for control measures. The body is about three-fourths of an inch long and heavy. The pupa surrounded by a hairy cocoon is attached to a tree twig, under loose pieces of bark on fences or on buildings. When placed on a twig, as is most frequent, it is usually wound in one or more leaves. The wingless female upon emerging clings to the cocoon and after mating deposits her eggs on one side of the cocoon and covers them with a white frothy coating in which stage the eggs of the second brood pass the winter. The spherical eggs are smooth except that they are covered with a lintlike mass. The color is a tawny cream. The largest diameter is slightly less than one millimeter. The eggs are almost always laid on the cocoon as already stated.

Numerous winter egg masses were collected and the eggs contained on fifty representative cocoons were carefully counted. The results were as follows:

332	382	540	481	667
469	472	500	237	415
406	461	456	302	466
516	579	454	559	422
569	674	362	460	449
534	460	526	278	507
568	402	548	527	506
602	567	688	303	341
700	438	410	708	335
504	378	328	491	573

The smallest number is seen to be 237 and the largest 708. The total number of eggs laid by the fifty moths was 23,812, making an average of 477.44.

The eggs that were collected and kept indoors began hatching the 7th of April. A large number of adults was thus reared under observation. A definite record was kept on the time of

each molt for several of the larvæ as shown in the following table:

Larvæ	No. 1	No. 2	No. 3	No. 4
Hatched	May 3	May 3	May 3	May 3
First Molt	May 9	May 9	May 9	May 9
Second Molt	May 13	May 13	May 13	May 13
Third Molt	May 18	May 18	May 19	May 19
Fourth Molt	May 23	May 24	May 24	May 25
Pupation	May 30	June 2	June 2	June 2
Emergence	June 6	June 12	June 8	June 7

Larvæ	No. 5	No. 6	No. 7	No. 8
Hatched	May 3	May 3	May 17	May 13
First Molt	May 9	May 9	May 25	May 26
Second Molt	May 13	May 13	May 30	May 30
Third Molt	May 19	May 19	June 5	June 5
Fourth Molt	May 25	May 26	June 8	June 12
Pupation	June 3	June 6	Lost	Lost
Emergence	June 9	June 13		

These rather few cases revealed the length of the larval period for the first brood to be 27 to 34 days and the pupal period to be from 5 to 10 days. These figures, of course, are for indoor conditions.

On June 25 caterpillars of the second brood began hatching. The female which laid these eggs emerged June 12 and laid her eggs a few hours after emergence.

It was observed from the larvæ that matured that the males emerged a day or two before the females. The life of the adult female is very short and in this way mating was not delayed.

Many experiments in the way of offering different food plants to the caterpillars and in changing the food from time to time were carried on. Eggs were collected during the winter from the following trees: birch, maple, elm, apple, and plum.

In captivity it was found that the caterpillars fed readily on leaves of box elder, mulberry, catalpa, buckeye, horse chestnut, maple, birch, elm, lilac, apple, plum, cherry, pear, cottonwood and sycamore. They were found to eat the leaves of many herbaceous plants as readily as those of trees. Leaves of dandelion, bluegrass, low-mallow, lamb's quarter, clover, geranium, iris, lily of the valley, and plantain thus proved acceptable. The common burdock was the only food which they refused. It was also found that they could readily be transferred from one food plant to another without serious consequences.

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